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ORIGINAL ARTICLES.

THE TREATMENT OF CORNEAL ULCERS BY THE ACTUAL CAUTERY.[1]

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Dr. de Schweinitz briefly sketched the history of the introduction of the actual cautery to the treatment of inflammatory diseases of the cornea, quoted the experiences and results of Nieden, Schweigger, Knapp and Gruening, and described the character of the lesion to which the heated point of a galvano- or thermo-cautery should be applied, referring at the same time to certain differences of opinion existing among ophthalmologists as to the exact types of disease which are benefited by this mode of treatment. He then proceeded as follows:

"Enough has been said to emphasize what is well known, that the method is among the most suitable of those employed to check the spread of local infection in sloughing ulcers, and

[1]Portion of a paper read to the Philadelphia County Medical Society, February 11, 1891.

it remains to add to the numerous reports upon this subject the few cases that I have treated with my own hand, about thirty in number. These include:

1. Small central ulcers in children of bad nutrition which, either through neglect or imperfect treatment, have tended to form an abscess.

2. Shallow central ulcers in scrofulous patients, the ulcer having a slightly turbid base, very chronic in its course and declining to heal under ordinary remedies; in all of the cases of this character there were the appearances of former granular lids, and in one active trachoma.

3. Phlyctenular ulcers, beginning in the form of small pustules at the corneal border, speedily ulcerating and surrounding themselves by a yellow area of infiltration, and with a strong tendency to perforate.

4. Infecting or sloughing ulcers, associated with pus in the anterior chamber, or, in other words, hypopyon keratitis.

5. Marginal ring ulcer, or that form which is sometimes seen in purulent ophthalmia, occurring just at the circumference of the cornea, often covered up by the chemotic conjunctiva, and very likely to perforate because it is hidden by the swollen tissues and not observed.

6. Herpes of the cornea, one being an example of an ulcer associated with herpes zoster ophthalmicus, and the other of true herpes of the cornea in which a vesicular eruption occurs, breaks down, and leaves an ulcer, that form which has been seen associated with herpes around the lips and nose.

I will not give the clinical history of these cases, as it would burden my communication unnecessarily with detail, except to say that the actual cautery had been applied only after other treatment had been used, either in my hands or in the hands of some one else. I have not a single bad result to record. In three of the cases porforation of the cornea took place with evacuation of the aqueous humor, twice as an accident during the application of the cautery, and once when the ulcer had nearly perforated and Descemet's membrane had bulged forward forming its floor, and I deliberately burned through the

tissue. In the cases of hypopyon keratitis perhaps it would have been wise, as Nieden has recommended, to have perforated the cornea with the thermo-cautery, but as the hypopya were not of great extent, I wished to see whether the application of the cautery to the surface of the cornea alone would produce absorption of the pus.

Method of Application.—Various forms of cautery have been employed, the most suitable being a small Paquelin thermo-cautery, or the galvano-caustic loop; the latter in the form devised by Professor Sattler, of Erlangen, is, according to Nieden, especially satisfactory. My experience has been entirely with more crude instruments, but which have answered the purpose, either a delicate probe suitably made of platinum, according to the recommendation of Gruening, or if this was not at hand, an ordinary steel needle, about the size of a knitting needle. According to the situation of the ulcer and according to the condition of the iris, the eye is either atropinized or eserinized, a few drops of cocaine are instilled to produce anæsthesia, a Bunsen burner is placed adjacent to the head of the patient, the probe is heated red hot, transferred to the point of disease, all of the sloughing material gently but thoroughly cauterized, and without undue pressure. It is not necessary to separate the lids with a stop speculum; in fact, this is probably a disadvantage putting some pressure upon the ball of the eye. They may be separated by the hand of the operator himself, or, if he is to be trusted, by those of an assistant. In restless young children, although not necessary, it is safer to induce general anæsthesia simply for the purpose of securing perfect quiet. After the application the eye may be washed out with a solution of boracic acid, a drop of atropine instilled, and a bandage applied. This latter procedure also is not required, but it has seemed to me to make the patient more comfortable. Quite commonly on the next day the bulbar conjunctiva is considerably injected, the eye looking angry and red; but if the cautery has been applied properly, the ulcer itself is cleaner and healthier, the surrounding cornea less nebulous, and if there has been pus in the anterior

chamber, this, in my very limited experience, has been nearly absorbed. Usually one application is sufficient, but it is well known this may be repeated on the third or fourth day, and indeed several times repeated according to the indications, provided the original destruction of the tissue has not been sufficient. I have never applied the cautery more than three times to the same ulcer.

Subsequent Treatment.—If the case has been unsuccessful, and it is not necessary to reapply the cautery, the treatment becomes simply that of an ordinary corneal ulcer which has been converted from a sloughing process, or from a chronic process, or from a process which relapses into a healthy ulcer, into an ulcer with the impulse of an active stimulation, or into an ulcer with the tendency to relapse removed.

The Question of Scars.—It has been urged against the employment of the actual cautery that a much more dense scar or leucoma was likely to form than when the ulcer was treated in the ordinary way. This, in the experience of the best ophthalmic surgeons, is a mistake. In my limited series of cases it certainly has never occurred that the resulting scar was greater than would have occurred had the cautery not been used; and I am strongly convinced that in every instance the scar was smaller than would have been the case had I not employed this agent. Touching this point, the following quotation from Fuchs[2] is *apropos:* "On the cauterized spot an opacity always remains, but as one cauterizes only that spot which without this would meet with the ulcerous disintegration, the final opacification, on account of this, will not be greater than it would have been in the first place." As I have just said, in the belief of many, it will not be as great.

In one example of central corneal ulcer going on to the formation of an abscess, after two cauterizations, in the second one of which I perforated the cornea, and in which a cure took place in less than two weeks, although the original disease had been running on for several months in the form of a series of

[2]Lehrbuch der Augenheilkunde, p. 169.

relapses, the ultimate vision was $^{20}/_{L}$ in spite of the nearly central situation of the disease. In the case of true herpes of the cornea, where a single application of a button cautery, very lightly applied, checked a process that began in September, and was active at the end of the following December, the result was only a faint diffuse haze over the center of the pupillary space, which by the correction of an astigmatism of a half dioptric, yielded a slightly clouded vision of $^{20}/_{XX}$. In a case of nearly central ulcer of the cornea with unhealthy margins, associated with phlyctenula around the margin, which had relapsed a number of times, in which the photophobia was very great and the brow pain severe, and in which good healing took place twenty days after the application, the resulting scar consists of a whitish band running diagonally across the pupil space, with a few old vessel channels traceable from it to the margin and scattered through it several minute white saturated spots; the vision is $^{20}/_{C}$ and one and one-half meter print can be read.

Contraindications.—In very extensive ulceration, involving a large area of the cornea, I would not use the actual cautery, certainly not until I had tried all other means, because in order to make it effectual and to stop that sloughing process, the application would have to be so great as to lead to the possibility of an excessive reaction. It should be remembered, however, that in just such cases very good results have been obtained. I have had no personal experience. The actual cautery should not be applied to an ulcer which has already perforated and to the margins of which the iris bas become adherent. Some cases of this character are on record in which a destructive inflammation with subsequent loss of the eye has been occasioned by the traveling back of the inflammation from the stump of the iris. The actual cautery does not seem to me to be indicated in those cases of hypopyon-keratitis in which there is a large ulcer associated with an hypopyon that nearly fills the anterior chamber, and in which it can be demonstrated that the collection is exceedingly tenacious, having assumed the character of a slough. Here Saemisch's

operation would seem to be better, because after its performance a delicate forceps can be introduced, and the offending material bodily removed, or it can be washed out, preferably with the admirable syringe devised by Lippincott, of Pittsburg. As Gruening aptly has said, "In these cases a combination of the two methods appears to be rational, for the actual cautery destroys the septic material of the cornea, and the Saemisch section removes the septic material from the anterior chamber." The actual cautery should not be used simply because there is a corneal ulcer. It is applicable especially to sloughing ulcers, to ulcers in which the spread of local infection is the dominant symptom, to ulcers which decline to heal under moderate means, like the bichloride of mercury method, the compressing antiseptic bandage, the use of eserine, the application of milder cauterizations with solutions of nitrate of silver, powdered iodoform, or scraping the base of the ulcer with a small curette.

Touching the limitation of the suppurative process in sloughing ulcers, Mr. Brudenell Carter somewhat enthusiastically says: "The most potent medical agent for the fulfillment of the first indication is eserine, which has been the means of saving numbers of eyes which without it must have perished." Agreeing thoroughly with this author's estimate of the great value of eserine, not only in sloughing ulcers, but in a host of other forms of corneal disease characterized by solutions in its continuity, we may say that in the event of the failure of this drug and other well recognized treatments, the actual cautery in its power to limit suppurative processes "has been the means of saving numbers of eyes," and with reasonably good vision, which without it might have perished.

ELECTRO-MAGNETIC EXTRACTION OF A PIECE OF STEEL FROM THE VITREOUS CHAMBER OF THE EYE[1]

BY CASEY A. WOOD, C.M., M.D.,

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Although the electro-magnet has had but a limited application in general surgery it has been used with signal success for the removal of steel and iron fragments from various parts of the eye. A full account of this subject has been given by Snell[2], of Sheffield, and Hirschberg[3], of Berlin. Hotz[4], of this city, has recently published a number of interesting cases.

Instances of this sort are not rare, but the successful extraction of metallic chips from the vitreous body, with preservation of the eye, is sufficiently uncommon to justify my saying a few words, introductory of a case of this kind, which I hope to present to you to-night.

The magnet which I use is Snell's. I find that it is now manufactured by Meyrowitz Bros., and is probably familiar to many of those present. "It consists of a core of insulated copper wire, and this again is enclosed in an ebonite case. To one end of the instrument are attached the screws to receive the battery connections. At the other extremity the core of the magnet projects just beyond the ebonite jacket, and is

[1]Read before the Chicago Medical Society, March 16, 1891.

[2]Simeon Snell: The Electro-Magnet and Its Employment in Ophthalmic Surgery, 1883.

[3]J. Hirschberg: Ueber die Ergebnisse der Magnetoperation in der Augenheilkunde. Graefe's Archiv f. Augenheilk. Abth. III, 1890.

[4] F. C. Hotz: Am. Jour. of Ophthalmology, 1889.

topped, and into it screws a needle which fits closely on the end of the instrument by a projecting cap. By this means it is possible to employ any kind of needle the operator may wish, or the case require, either curved or straight. Each sort of needle will, perhaps, be more adapted to a particular case."[5] It will be remembered that since in electro-magnets the magnetic force decreases very rapidly, as the size of the needle decreases and the distance of its point from the helix increases, it is advisable to employ as large and as short attachments as possible. Another law of electro-magnetism should not be forgotten, viz.: The attractive force is greatest at the moment when the current begins to flow. The small button which serves this purpose should, therefore, not be touched until the needle is in position. Instead of using a quart bichromate element, formerly recommended, I have employed a small storage cell. Its electromotive force is about 2 volts; it admits of easy transportation and answers the intended purpose admirably. It will readily be seen that a piece of iron sticking into the cornea, lodged in the anterior chamber, or entangled in the iris, or even having penetrated the lens capsule, is much more easy of extraction than when it has entered the posterior chamber, because in the latter situation, (1) it is less accessible, and (2) it is very likely to be invisible, owing to the intra-ocular bleeding, which often obscures an ophthalmoscopic view. In the treatment of the following case I had the benefit of the advice and assistance of my associate, Dr. W. F. Smith:

T. J., æt. 24, at 8 A.M., on January 27, last, was struck in the right eye by a minute fragment that flew from a piece of steel he was hammering. He consulted Dr. John Fisher, who very properly ordered a solution of atropine to be dropped into the eye. Dr. Fisher very kindly referred the patient to me, and I saw him at 3 P.M., seven hours after the accident.

He was not then complaining of pain, but felt dizzy. In the upper inner quadrant of the right cornea, close to the lim-

[5]Snell, l. c., p. 7.

bus, was to be seen a faint line which corresponded to a penetrating wound of the iris. The posterior layer of the cornea was streaked with blood, and there was in addition some blood lying free in the anterior chamber. No clear view was to be had of fundus. V=fingers at 50 cm. As the patient at first described the piece of steel as coming from below, and was not very clear as to its probable size, it was thought possible that the sharp corner of a fragment might have made a wound through cornea and iris, and cut its way out again. At any rate it was decided to wait until some of the effused blood had undergone absorption. The conjunctival sac was thoroughly disinfected, more atropine solution instilled, and the eye was dressed with boracic acid powder and a bandage. Three days afterward the anterior chamber is free of blood, but there is a decided pericorneal injection, and the patient suffers from occasional attacks of pain in and about the eye. A wound in the lens can now be plainly seen through the dilated pupil. The posterior pole of the crystalline is hazy, and apparently covered with blood. Two clots can be seen rolling about in the lower part of the vitreous chamber. Only portions of the fundus can be made out. I concluded after considerable questioning of the patient that the fragment came from above the horizontal plane of his face, and as the symptoms seemed to indicate the presence of a foreign body in the interior of the eye, I decided to operate.

Believing that it would not be wise to attempt its removal through the original wound, on January 31, the patient was anæsthetized and a straight equatorial incision (8 mm. long) was made with a Graefe knife through the sclera about a centimeter behind the limbus at the lower outer quadrant of the hemisphere. Another wound of about the same length, but at right angles to this, was first carried through the conjunctiva and Tenon's capsule, so that when both wounds were closed, the vitreous chamber was effectively shut off from the outside air. A bent and flat needle was carefully introduced into the vitreous, and after several re-introductions and "fishing" about, a small bit of steel was withdrawn, attached to the

tip of the magnet end. Little or no vitreous was lost. A few stitches were put through the conjunctival flaps and the eye was again dressed with boric acid powder. The greatest care was observed as to the use of antiseptics, and the wound healed without the least difficulty. The pain and ciliary injection disappeared, and two weeks afterward V = fingers at 1 m. Since then portions of lens matter have presented in the lenticular wound, have produced some irritation (pain, tenderness, circumcorneal redness, etc.,) which had disappeared under the use of hot applications and atropine, and the protruding masses have finally become absorbed. I propose to do an iridectomy, preparatory to needling the cataractous lens, which I trust, is capable of absorption, or perhaps, removal with Bowman's syringe. The extracted metal weighed 17.7 milligrams.

NOTES OF A CASE OF DIABETIC CATARACT OPERATED UPON BY DR. C. R. AGNEW.

BY DAVID WEBSTER, M.D., NEW YORK.

Miss Katie L. S., æt. 22, was referred to Dr. C. R. Agnew by Dr. Peaslee, on account of blurring of her sight. She was a teacher, and very anxious to regain the use of her eyes. On March 14, 1876, at her first visit, she had vision $^{20}/_{c}$, each eye, and the sight could be raised to $^{20}/_{LXX}$ in either eye, with a — 48 c. axis 90°. Ophthalmoscopic examination showed immature cataract in both eyes.

The patient gave the following history: In the fall of 1872 she first experienced symptoms of diabetes, excessive thirst, passing large quantities of urine, general debility, etc. Sugar was found in her urine in considerable quantities. She had been under Dr. Peaslee's care for the last six months, and seemed to be improving.

Fifteen months ago she became very near-sighted, and for about five months wore strong concave glasses. Then, while under electrical treatment, general and local, her near-sightedness passed off, and she went without glasses for about three months, when far-sightedness came on gradually. She has worn strong convex glasses until within the last two or three weeks, when she found that no glasses enabled her to see well, and her eyes became sensitive to light.

April 22, 1876. Vision, $^{20}/_{LXX}$, and no improvement with glasses.

As the cataract seemed to have reached a stage where it neither progressed nor retrograded, and as the young lady was anxious to recover her ability to read, Dr. Agnew decided to

commence operation for the absorption of the lens in the left eye, without further delay.

April 26, 1876. First needling; simply opening the centre of the anterior capsule.

May 26, 1876. Second needling; the anterior capsule opened a little more freely.

September 9, 1876. Third needling; the central portion of the lens stirred up pretty freely.

September 25, 1876. Fourth needling; a very free opening of the capsule and stirring up of the lens.

October 11, 1876. Fifth needling; most of the lens substance is already absorbed.

The pupil was kept dilated by atropine throughout the whole period of treatment.

December 13, 1876. The patient died suddenly, just as she was beginning to enjoy her recovered vision.

While diabetes effects the prognosis, I do not consider it a contraindication to cataract operations. I have had several cases of successful extraction in diabetic patients. My impression is that the eye heals as readily as in patients whose health is unaffected.

ALTERATION IN THE REFRACTION OF THE EYE; CHANGE FROM HYPERMETROPIA TO MYOPIC ASTIGMATISM.

BY S C. AYRES, M.D., OF CINCINNATI.

Alterations in the refraction of the eye come under our observation from time to time and are always matters of interest. We frequently see progressive myopia and changes from hyperopic to myopic astigmatism. Cases where hyperopic astigmatism has increased have been recently reported. In the case which I shall report there was an alteration from hyperopic to myopic astigmatism, but the symptoms preceding and accompanying this change were so aggravated that I take the liberty of presenting it.

It was in the person of a gentleman whom I first saw in 1872. He then had under atropine test H. 0.5 with perfect vision in both eyes. There was paresis of accommodation and insufficiency of the internal recti muscles. Prisms were ordered and his general condition treated. He abstained from use of his eyes and waited patiently for some improvement. His asthenopic symptoms were so aggravated that he could not attend to his professional work and he finally concluded to go to California and lead an out-door life hoping that this would give him relief. In his new home he engaged in the cultivation of fruit, and while his physical condition was excellent, his eyes seemed but little better. So things went on for several years. He could read but little and the bright day-light was very painful to him and he had difficulty in driving.

In 1884 he went to an oculist in San Francisco, whose name I regret I cannot give, and had his eyes tested. A critical ex-

amination developed the fact that he had myopic astigmatism 1.5 D. H. o in both eyes. These lenses gave him complete relief, and so great was the relief that he said when he got his glasses he sat in the doctor's office and read for two hours, a luxury he had not enjoyed for many years. With these glasses he could see perfectly in the distance and had no further trouble in driving, and daylight was no longer painful to him. He could also read with the greatest comfort by natural or artificial light.

I saw him in December, 1890, and he complained of his glasses for reading. I found that he only needed the convex cylinders for reading. His vision was perfect in both eyes with the cylinders he had worn for six years. For about twelve years he had the most disagreeable asthenopic symptoms and they were not relieved until his myopic astigmatism was corrected. It is not certain how long his eyes were undergoing this change in refraction. It seems probable that he might have had relief sooner than he did.

THE ECCENTRIC GROWTH OF EYELASHES.

BY FRANCIS M. CHISOLM, M.D.,

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An eccentricity in the growth of a hair has been curiously illustrated in the two following cases, the one of which applied for treatment to the Presbyterian Hospital and the other was seen in private practice. Both were alike in their nature, the one occurring in an adult, the other in a child 10 years of age. In each the appearance was of a dark bluish line about half an inch in length running directly upward from the ciliary border of the lid and narrowing down to a point.

In each case when this line was first discovered by the patient it was believed to be a streak of dirt. When, however, after repeated washings it could not be removed and had become a source of annoyance, they applied for treatment to their family physicians, who diagnosed the condition as one of an enlarged superficial vein of the lid and therefore incurable.

When they came under my observation the appearance of the lid with this fine blue-black vertical line under the skin was quite curious. On examining with a magnifying glass it was discerned to be the shaft of a hair. A growing eye lash, as it was about emerging from the free border of the lid, had had its point caught in some unexplaineble way under the epithelial lining of the hair follicle. It was in this way diverted from its natural course and twisting directly upon itself, bound down as it was by the cuticle, it had continued growing upward. Acting mechanically as a wedge, pressing upon the epithelium and pushing its way through these layers, it had tunneled for itself a passage under the skin, until the full growth of the hair had been reached.

It was found that as the lash emerged from its follicle in growing the epithelial covering had disappeared near the root, exposing a loop under which a fine probe could be passed. The disfiguring black streak was made to disappear at once from the lid by introducing a fine hook in this loop and pulling the hair out from its artificial sheath. It did not break off but came out entirely and assumed its natural position among the lashes. On account of the nervousness of the child this had to be done under the influence of an anæsthetic.

SELECTIONS FROM AMERICAN MEDICAL JOURNALS.

ACUTE TRANSITORY BLINDNESS AND WHOOPING-COUGH.

BY GEORGE W. JACOBY, M.D.

Bilateral loss of sight of brief duration, and occurring suddenly in patients whose state of health does not direct our attention to any possible ocular complication, must be considered an event of the greatest interest to the neurologist as well as to the ophthalmologist. Such a complication has been known to occur occasionally in certain blood states and to be of frequent happening in cases of uræmia. In the latter condition, in addition to the blindness, other serious uræmic symptoms, such as disordered consciousness and convulsion, are generally present. But cases have been described as occurring after acute diseases in which, notwithstanding the absence of any ureæmic manifestations, the symptom of blindness was ascribed to uræmia, this condition having been assumed to exist from the fact of the urine having been albuminous. Such cases have been most frequently described as occurring after or during scarlet fever, but their occurrence after typhoid is also known.

Cases of this kind were, so far as I know, first described by Ebert in 1868, when he reported three cases of transitory blindness occurring after or during scarlet fever, and one case supervening upon typhoid. All of Ebert's cases also showed symptoms of nephritis.

Cases of transitory blindness occurring after other acute

diseases and unassociated with nephritis or uræmic symptoms must be of great value in assisting the formation of any conclusion as to the nature of the pathological process which produces this alarming symptom. I am able to report two such cases, both of which occurred during an attack of whooping-cough. Two similar cases, also occurring during whooping-cough, have been previously reported by Alexander. My cases were as follows:

CASE I.—Seen first on November 15, 1888. F. L., a girl æt. 6. I saw the child in consultation with Dr. D. Froehlich, of this city. The girl had had various diseases of childhood, all of which passed over without any serious complications. When two years of age she had an attack of pneumonia, during which she also had convulsions; complete recovery from this attack was made. At various times the child had complained of severe occipital headache, which each time proved to be a prodromal symptom of some other affection (measles, dysentery). The other children of the family have recently had or are just recovering from an attack of whooping-cough. Since several weeks this child also has had a spasmodic cough, which presents all the characteristics of pertussis, but in a mild form; vomiting has occurred several times, but always in conjunction with an attack of cough; occipital pain was also present in the same manner as it had been on the occasion of former sicknesses. The day before yesterday, the mother coming home in the early afternoon, having left the child playing when she went out, was greeted with the remark, "Why did you stay out so late? It is so dark." The mother, attracted by these words, noticed the staring expression of the child and soon became aware that the child was blind. An ophthalmological examination, made by Dr. Gruening the ensuing day, resulted as follows: Pupils dilated *ad maximum*, without reaction to light or to convergence. Ophthalmoscopically, neuritis on both sides without any hæmorrhages into the opticus. Quantitative perception of light.

The succeeding day, when I saw the patient, I found a child showing no objective symptoms of any kind, except the ocular

ones, which could be referred to the nervous system. The child's appearance was cachectic, but she was cheerful and did not complain of any ill feeling. The reaction of the pupils was as described above. The kidneys and heart were normal. No headache, vomiting, or fever. The following day (16th) the right pupil reacted to light; child says that she can see. An examination showed that vision was limited to the right eye, and that with this eye the patient could recognize large objects, such as a watch, at five inches. The child was again seen by me on the 18th, when it was noticed that the left pupil also reacted to light and that large objects could easily be distinguished with both eyes. On the 20th further improvement of vision was noted. On the 22d she was also seen again by Dr. Gruening, whose report was, "Pupils react to light and to convergence; the child can count fingers at a distance of the length of the room. Ophthalmoscopically, papillæ slightly hazy."

November 28.—Improvement has been constant; vision now normal; ophthalmoscopic examination negative. Since that time the child has been and is now perfectly well.

CASE II.—October 8, 1890; M. C., boy æt. 8. Patient has had a whooping-cough since the end of August. The course of the affection had been a perfectly normal one until October 1. The spasms of cough were not unusually severe, and there were no complications of any kind. The boy, who had always been anæmic, had at various times before and after the attack of cough complained of headache and had also vomited frequently during the paroxysms of cough, but both headache and vomiting were only temporary occurrences. On October 1, contrary to his general habit, he was peevish and irritable. In the afternoon he complained of intense headache and vomited several times spontaneously (without having taken food or having had an attack of cough). The night was passed quietly. The following day, headache and vomiting continuing, the child was, by advice of the physician, placed in a dark room with ice to its head. The headache and vomiting ceased, but the boy was kept in the dark room for three days. During

this time he frequently said that he could not see, but the mother attributed this solely to the darkness of the room and did not think it necessary to mention the fact to the attending physician. October 5, the child was taken from the dark room, and it then at once became apparent that he could not see; all its actions were those of a child totally deprived of vision. The condition of the patient when I first saw him on October 8, was as follows: Child well nourished and playing (jumping in bed). No complaints of any nature. Temperature and pulse normal. Heart normal, urine acid, specific gravity 1015. No albumin, no paresis of any muscles; sensation, superficial and deep reflexes normal; hearing and smell normal. The child, however, was totally blind; he was unable to distinguish light from darkness, even when a lighted candle was held close to his eyes. Externally, the eyes were normal, the pupils were of medium size and reacted well to light, the media were clear, and the fundus was normal. This condition of complete blindness unassociated with any other symptom lasted unchanged until October 10, when a rapid change for the better occurred; it was then noted that the child could distinguish objects and count fingers at six feet, but it was also noted that this could only be done when the objects were held upon the left side of the patient. A perimetric examination was not made, but, as the child was a very intelligent one, there was no difficulty in observing, with the aid of a white object against a black board, that well-marked right hemianopsia existed. This condition remained stationary for twenty-four hours, and on the 12th it was not present any more, the child being able to recognize objects at ten feet, although not as well upon the right side as upon the left. Two days later vision was normal for the entire field. Since then the child has remained well.

In what I believe to be a complete survey of the literature of the subject of blindness after or during whooping-cough, the following were the only references which I was able to find: Knapp, in 1874, published a case in which the pupils responded promptly to changes of light, and ophthalmoscopi-

cally an ischæmia retinæ was found. Knapp thinks the ischæmia retinæ was caused by hæmorrhagic effusion into the sheaths of the optic nerves, or, more probably, by the general anæmia and weak cardiac action of the patient. The remarks made by Knapp in connection with this case are so interesting that I will reproduce them here. He says: "Blindness is a very rare symptom of whooping-cough. When, on the occasion of a case of that kind, I asked some of my New York colleagues about its occurrence, Prof. Loomis told me that blindness in whooping-cough had been observed, but almost exclusively in children who afterward died from lobular pneumonia. According to that, blindness in whooping-cough would be an ominous symptom." This patient of Knapp's died in the same manner. Steffen, speaking of whooping-cough, says: "We must also refer to blood stasis, the observation of Sbregondi, according to which a girl æt. 6 is said to have been blind each time during the attack. A year ago I treated a girl æt. 8, who during the attack saw indistinctly, but also, as long as the spasmodic stage lasted, part of the acuity of vision was lost in the intervals of the attacks."

Smith has published a case of severe whooping-cough, chronic broncho-pneumonia, first right then left hemiplegia, failure of vision, unconsciousness, spasmodic respiration, and almost complete general insensibility of the surface, with ultimate recovery. The temperature in this case was subnormal; the pupils were largely dilated, with complete failure to respond to light.

Silex reports the case of a girl a year and three quarters of age who three months before had whooping-cough; also accidental poisoning with morphine; recovery from the effects of the morphine; then a paralysis of the right side and a strabismus divergens of the left eye was noticed. On the fourth day after the accident reflex action of the pupils was present, but approach of the finger did not cause closure of the eyes. On the twelfth day the paralysis had disappeared and the child was conscious; the sight was then tested and it was found to be less than before the accident. Examination three

months later showed that the child did not see objects on its right side. After three months more, recovery took place. Silex believes that in this case there was a hæmorrhage in the posterior part of the internal capsule, and explains the transient hemianopsia by pressure on the tractus opticus.

Alexander's two cases, to which I have already referred, are as follows: Boy æt. 3, since July, severe pertussis with long-continued spasmodic stage. In August, cerebral symptoms, fever, terror, nocturnus, irritability, lack of playfulness, and frequent vomiting, both spontaneously and upon taking food. On the morning of August 3, the parents observed that the child could not see. A physician noted complete blindness. Alexander saw the patient the same day and found complete bilateral loss of sight; temperature 38.2° C., urine free from albumin, internal organs normal, muscular movements intact; pupils of medium size and reacting well to fixation and to light; media clear and fundus normal, but the central vein seemed somewhat enlarged, the arteries, however, being of normal caliber. Total loss of sight continued, cerebral symptoms increased, twitchings of the extremities supervened, the child became comatose, and, under symptoms of cerebral pressure, death took place after fourteen days.

His next case was still under treatment at the time of publication. A girl had had pertussis, and fourteen days prior to the occurrence of the blindness she complained of headache. About the middle of September the child complained of objects appearing hazy; gradually the sight became more and more affected, and on October 3, Alexander found complete blindness. There were no other symptoms of any kind, and the urine was free from albumin. The child could not see a large flame; both pupils were dilated and rigid, without any reaction to light or to accomodation.

Ophthalmoscopically, neuritis optica bilateralis; both papillæ somewhat swollen, opaque, contours blurred but recognizable. No hæmorrhages. Under treatment, first the right and then the left pupil began to react. At the same time the sight improved, and on November 1, fingers could be counted at eight

inches; middle of that month sight was $^{17}/_{cc}$, and on the 25th $^{17}/_{c}$; ophthalmoscopically, a retrogression of the neuritis was noticeable; at the time of publication atrophy of the optic nerves had set in, and hope of complete recovery was not warranted.

If we analyze these nine cases we find that only four of them are available for any deductions or generalizations, these four cases being Alexander's and my own. Knapp's case was published at a time when less attention was paid to the significance of the pupillary reaction, so, notwithstanding that in this case the pupils reacted promptly to light, Knapp thought the blindness was due to ischæmia retinæ. The other data given are too sparse to enable us to form an opinion of the case. The reference to Sbregondi's and to Steffen's cases are of value in so far only as they show the occurrence of blindness in whooping-cough. In Smith's case the failure of vision was a part of other severe focal symptoms; the complication of symptoms renders the case uninstructive. Silex's case was unfortunately complicated with poisoning by morphine, and it is, therefore, not possible to say whether the assumed cerebral hæmorrhage was due to the whooping-cough or not.

An analysis, however, of Alexander's cases and my own, taken together with the reported cases of blindness after scarlet fever and typhoid, shows us that we are dealing with two kinds of cases—those in which the pupils react to light, and those in which this action is abolished. That in both of these classes we are dealing with some intracranial process there can be no doubt, and the significance of the difference in the pupillary reaction is not to be sought in this direction; it is as an indication to the seat of the process that this difference will serve.

What the exact place is, affection of which abolishes the light reflex, is, if we except the experiments of Mendel, only hypothesis; it is, however, unnecessary for our present purpose to know the precise anatomical location of this place. From reasoning and from experiments we can be certain that this place is situated somewhere in the reflex arc between the op-

ticus and the oculo-motorius; that the place must be sought somewhere in the brain, between the seat of certain fibers of the opticus (pupillary fibers) and the place of origin of the branches of the motor oculi which supply the sphincter iridis. We also know that the reaction of the pupils to light depends upon the uninterrupted conduction from the retina through the opticus to the corpora quadrigemina, and thence through the theoretical connection to the oculo-motorius.

Von Graefe, in the discussion of Ebert's paper, called attention to these facts and to the deductions from them; that, according to the reaction of the pupils, the seat of the causal affection will be retrobulbar, if no reaction of the pupils to light is present; whereas if this reaction is preserved, then the seat of the lesion must be situated at some point between the corpora quadrigemina and the seat of light perception in the brain. The value of this distinction in the location of the process lies in its prognostic significance, for, as von Graefe says, if the pupillary reaction to light is present, then the prognosis as regards recovery of sight is always favorable, excepting, of course, processes of such a nature that death is thereby caused; while, on the other hand, if the reaction of the pupils is lost, the process being retrobulbar, there may be permanent loss of sight. The prognosis of these cases, however, can not be formed from the location of the process alone, but will, also, as in every other affection, depend upon its nature. As in many of these cases recovery has taken place in a very short period of time, we must assume transitory brain process; what this process is, pathologically, has been a matter of some dispute, and is still undecided. Ebert believed the process to consist of an acute transient œdema. Notwithstanding the fact that, neurologically, the term œdema cerebri, whether used as a term explanatory of the cause of death, or whether used *intra vitam* as an explanation of certain symptoms, is to-day, treated with but scant courtesy. I must admit that, in view of my cases, I can not do otherwise than concur in Ebert's opinion. In support of this view, I may be allowed to adduce the following facts:

Transitory bilateral blindness occurs most frequently during or after scarlet fever. In this disease also we most frequently see transitory œdema of the skin, which changes its position from day to day. Also in this disease are patients not uncommonly attacked, while feeling perfectly well, with headache, vomiting, "uræmic convulsions," followed by death within a few hours, and upon autopsy a highly anæmic or highly œdematous kidney is found; frequently such patients recover as suddenly as they were attacked. Furthermore, in such cases of scarlet fever, cerebral complications are frequent, for which, after death, no explanatory changes can be found except an œdematous infiltration. Also is it probable, according to the investigations of Traube, Rilliet and Barthez, and others, that the so-called uræmic symptoms in many cases of scarlet fever are due to an œdema of the brain, analogous to the œdema of the kidney, but not in any way dependent upon any kidney affection. Finally, Leichtenstern has observed the following cases of scarlet fever: 1. A case of gradually developing uræmic coma, without any other antecedent uræmic symptoms, which upon autopsy showed only anæmia of the brain with moderate œdema. 2. A case of uræmic hemianopsia in an intelligent boy, following upon severe convulsions. 3. A case of uræmic aphasia without obscuration of the sensorium. From these cases Leichtenstern draws the following deductions: That œdema of the frontal lobes and hydrops ventriculorum produces the so-called uræmic coma; that bilateral uræmic convulsion and uræmic hemiplegia are dependent upon a more intense affection of the cortical motor area or of the motor tract of one hemisphere; that the uræmic headache is dependent upon anæmic irritation, or upon inflammatory œdema of the cerebral membranes; finally, that bilateral uræmia amaurosis with normal pupillary reaction is dependent upon anæmia and œdema of both occipital lobes, while œdema of only one occipital lobe produces the corresponding hemianopsia and that the uræmic amaurosis with absent pupillary reaction is dependent upon an œdema of retrobulbar parts anterior to the corpora quadrigemina, provided that a re-

tinal œdema could not also cause such amaurosis. Leichtenstern does not doubt that unilateral uræmic amaurosis is produced in the way last mentioned.

It is not my intention to enter now upon the question of the pathological diagnosis "œdema cerebri," nor even to maintain the existence of a non-inflammatory form of cerebral œdema, for the reason that neither of these questions are germaine to my subject; but this much is certain, from the above cited and from other studies, that the existence of an inflammatory œdema is a positive scientific fact as regards which there ought to-day not to be any doubt, notwithstanding all assertions to the contrary. As Huguenin has clearly stated, the only question upon which there can be any difference of opinion is as to what we should consider an œdema, but that if we look upon the term œdema as synonymous with encephalitis, then in the majority of instances we will be clear in our ideas. Of course, the question of inflammatory œdema after acute diseases is one which is still surrounded by darkness; but it seems to me that even in these cases the mode of production is not difficult to understand, if we are willing to admit that the inflammatory œdema here is caused by direct action of infectious material. It is not difficult to conceive how, in whooping cough, the direct action of the *Bacillus pertussis* (Dolan, Burger, Schwenker) can produce these results; neither can any argument against this reasoning be found in the results obtained from post-mortem examinations of the brain and meninges in ordinary cases of pertussis, or in such autopsies injection and enlargement of the vessels, with cerebral engorgement and ventricular effusion, are found, but signs of softening are wanting. The vessels of the membranes, not only of the brain but or the cord as well, are also found in this condition.

Having thus specified the position which I take in regard to this question, I am now able to briefly discuss the significance of my cases. The first case—with the sudden onset of total blindness, with rigidity of the pupils and slight retinal changes, with rapid re-establishment of the light reflex and vision in

the left eye, together with complete restoration of vision and disappearance of all ophthalmoscopic changes in the retina in less than two weeks, all of which occurred without any other cerebral symptom whatever—can not possibly be understood in any other way than by the assumption of a cerebral œdema. Whether this œdema was retrobulbar alone, or also occupied a place between the corpora quadrigemina and the occipital lobes, can not be postively answered. On account of the re-establishment of the pupillary action to light inside twenty-four hours, it would seem that the œdema anterior to the corpora quadrigemina must have been rapidly but unequally absorbed. As the re-estsblishment of the reaction to light was accompanied by re-establishment of vision and disappearance of retinal changes, it is probable that the entire œdema was situated anteriorly to the corpora quadrigemina. A question which I was unable to solve, and would be of importance in this connection, is whether the pupillary reaction set in before a return of vision took place. To me it seemed as though both occurrences took place at the same time, although, on account of the rapidity of the amelioration, it is impossible for me to express myself upon this point with any degree of certainty.

The second case is, if anything, even still clearer. This child had marked symptoms of a cerebral type, followed by blindness with retained reaction of the pupils to light, followed first by hemianopsia and then by gradual restoration of perfect vision, the entire period covered by these symptoms being but twelve days. The case throughout was precisely like those which occur in scarlet fever and which are termed "uræmic," except that here there was at no time any question of kidney disorder. What other affection than an œdema—at first implicating both occipital lobes, and then, as absorption set in, limited, for a short time only it is true, to one occipital lobe—can explain this case I am unable to see.

Alexander also believed that in his first case there must have been an œdema between the region of the corpora quadrigemina and the occiptal lobes, and the recovery of vision was pre-

vented only by the extension of the œdema to parts affection of which made a prolongation of life impossible. His second case was in many ways similar to my first, and I am unable to appreciate his reasons for making a diagnosis of meningitis in this case.

In whatsoever manner we may look upon the pathological sides of these cases, we must not overlook the practical lessons they teach us; that in whooping-cough, as well as in other acute diseases, sudden transitory blindness may occur, and, what is more important, that children so afflicted do not all die, but may recover, and with re-establishment of perfect vision.

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BLEPHAROCHEILOPLASTIC OPERATIONS.[1]

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Two years ago I brought before the Ophthalmological Section of the British Medical Association (Glasgow meeting) the subject of entropion and trichiasis, with special reference to the operative measures for their cure. I would not again venture to bring the subject forward in any form but that I have received so many letters from different ophthalmic surgeons asking for further information regarding the operation of transplanting mucous membrane from the mouth to the eyelids.

In Ireland, where granular ophthalmia and, consequently, entropion and trichiasis are so common, we have such a large field for testing the value of any operation of the sort, that it is natural we should try various modifications in the details as in the larger features of the method. The operation, as at present performed at St. Mark's Ophthalmic Hospital, is what I purpose describing, and I shall not delay to mention the various modifications by which it reached its present form. It will be obvious to anyone who cares to compare the two that the details differ materially from those described by Van Millingen in the *Ophthalmic Review*, vol. vi, p. 309.

The operation is of necessity a somewhat tedious one, and simplicity of manipulation has always been our endeavor. "The St. Mark's Hospital operrtion" consists in:

1. Splitting the affected lid along the whole length of its free border with a small scalpel, or a broad cutting needle, or a Beer's knife. The incision must be made so that all the

[1]Read in the Section of Ophthalmology at the Annual Meeting of the British Medical Association held in Birmingham, July, 1890.

cilia, both normal and abnormal, are in the anterior or skin flap, and all the conjunctiva is in the posterior flap. The making of this incision is by far the most difficult and important part of the operation. It is best accomplished by using Knapp's modification of Snellen's clamp, and the larger the instrument that can be inserted into the palpebral aperture the better will be the result. By using the clamp all hæmorrhage is prevented during the operation, and the line of the incision can be accurately made so as to avoid the hair bulbs in the lid, and also the depth of the incision can be more easily estimated. The incision should run obliquely through the tarsus, and extend into the subcutaneous tissue of the lid, otherwise the wound does not gape freely and the transplanted flap is squeezed out of its place by the rigid lips of the incision.

Before considering the section complete it is advisable to use a pair of fairly fine-bladed scissors along the incision, so as to completely divide any remnants of the tarsus that escaped the scapel. The splitting of the lid being now completed, the clamp is not removed, but a pledget of cotton-wool, wet in boric lotion, is laid over it. Another large clamp is then taken and applied to the lip—upper or lower, according to taste—and screwed tightly down. The lip being then everted, two parallel incisions are made the full length of the incision in the lid, and from 3 to 5 millimeters, or even 6 millimeters, apart, if the deformity to be corrected is very great.

These incisions converge rapidly at each end, so as to leave pointed extremities to the flap, which is then dissected up with a pair of scissors. The worm-like flap of mucous membrane so obtained is then turned, with its submucous surface upward, upon the operator's left hand, and the submucous fat and areolar tissue removed with the scissors.

While this is being done by the operator, an assistant puts in a couple of sutures loosely into the lip wound, and then, removing the clamp, these are brought together. This is by no means essential, but facilitates the healing of the lip. Pressure is then kept up on the lip by an assistant who uses a pledget of boric wool over the wound for the purpose.

When the flap is freed from its fat, etc., a fine waxed silk suture is passed through, close to its pointed extremity, from mucous to raw surface; the needle is then passed through the lid at the angle of the incision, from raw surface to lid border, and tied into position. By making a large knot on the suture a few inches from its end, the point of the flap can be drawn closely into the angle of the incision and kept in close apposition with it. Another similar suture is applied to the other end, and two, three or four sutures are used to keep the edges of the flap in close apposition with the lips of the lid wound.

These sutures are not absolutely essential, but our experience shows that they do no harm whatever, and greatly add to the security of the flap in its proper position and the consequent certainty with which it lives in every part.

When the flap is fixed in position, with as many sutures as the operator cares to use (I generally apply six together) the clamp is unscrewed. The operation up to that had been practically bloodless, but the moment the clamp is removed a very brisk hæmorrhage ensues, which, but for the sutures, would undoubtedly displace the flap. Pledgets of cotton wadding, wet with boric lotion, applied over the lids, speedily cause the hæmorrhage to diminish, and soon to cease altogether.

At first we had apprehensions as to the consequences of leaving the clots that form about the wound, fearing they would interfere with the vitality of the transplanted flap; but here again experience proved our fears to be groundless. In no case (though I have seen some with very severe and long continued hæmorrhage) can I remember to have seen trouble from this cause.

When the bleeding has been fairly well abated, a dressing of iodoform ointment on lint, and wet boric wool over it, is applied to the eye; a small portion of oil silk and some dry cotton wool is placed over this, and the whole is kept in position by a light bandage. This dressing is reapplied night and morning. The sutures are removed after three or four days (or sooner, if there is any reason for so doing), and soon after the sutures are removed the bandage is left off.

The changes in color which the transplanted flap undergoes are remarkable. When first transplanted it is almost white and utterly bloodless. After twenty-four hours it turns a peculiar dark, almost black red, like an old blood clot, and in another twenty-four it becomes a bright healthy looking pink color, which it retains for ever after.

The advantages of this operation over all that preceded it for the cure of entropion and trichiasis are too obvious, and have been too often stated to make any repetition of them by me necessary.

Our experience at St. Mark's Hospital is very large in the class of cases that require this operation, and I can state without fear of contradiction, that no other operation has ever given us at all the same perfection and permanence of result as we have obtained by the blepharocheiloplastic operation. —*Brit. Med. Jour.*